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APPROVED

EPICHEM, INC.

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June 23, 1983

Mr. Charles Murdock
Assistant Attorney General
State of Illinois
160 North LaSalle Street - Room 900
Chicago, Illinois 60601

Re: Potential value of scrap X-ray film in manufacture of chemical products

Dear Mr. Murdock:

In this letter I shall endeavor to summarize my thoughts and opinions pursuant to our telephone conversation this morning regarding the large quantity of scrap x-ray film presently stored in Chicago.

For more than two years, Epichem has been engaged intensively in several R & D projects directed toward recovery and reuse of polyester scrap, and especially poly[ethylene terephthalate] scrap in the form of spent beverage containers and by-products of the U.S. fiber industries. In the past year, we have reached the pilot production stage in one such project and just last week consumed more than 10,000 pounds of polyester scrap (PET) from beverage containers in the production of a single pilot batch of resin for the paint industry. In the coming weeks we expect to begin full-scale commercial production of such products which, typically, will require upwards of 25,000 pounds of the PET scrap per batch.

It is our understanding that the subject x-ray film is comprised mainly of slightly contaminated poly[ethylene terephthalate] (PET). Therefore, it is understandable that we have a potential interest in the film as a low-cost source of raw material. We would have a <u>definite</u> interest in the film as a raw material <u>if</u> it were offered to us as substantially clean PET polyester at a price competitive with other PET scrap, and I am confident that a number of other parties would share our interest.

Very approximately, the value of the PET film in a cleaned-up form suitable for general resin synthesis purposes is 8-15¢ per pound, f.o.b. shipping point. Sometimes, we pay higher prices for very clean PET scrap which does not impart color to derived resin products. The subject x-ray film contains a blue dye which likely would impart significant color and, therefore, I would expect that 8-10¢/lb. is a more realistic estimate of the potential value of this film if offered substantially free of objectionable impurities.

Several weeks ago, Petrochem Services, Inc. sent us a sample of film which had been treated to reduce the cyanide level by means of their process. We have made one attempt to convert this sample to a typical resin raw material such as we might use in one of our own proprietary processes, with the following results and observations:

(1) The sample contained about 20% water by weight, together with sufficient dissolved chlorine to produce a strong odor. The water alone does not represent a problem.

(2) The resin intermediate developed an intense blue-black color. It is not clear whether this was due to the dye alone, or to chlorination/oxidation processes caused by the residual free chlorine, or both.

(3) The product contained an apparently minor weight fraction of unreacted and/or partially reacted film solids. This is believed to be due to contamination of the bulk polyester film chips with another type of polymer film, such as cellulose acetate.

We have discussed these preliminary results with Petrochem, and there is agreement that the free chlorine could easily be removed by an additional water wash of the material. At the same time, the minor fraction of cellulose acetate film could be removed by flotation, making use of the fact that it is much lower in density than the polyester (PET) film.

We do not project that a minor residuum of cyanide, especially if it is chemically bound to the polyester and/or contained dye, would interfere with most chemical processes in which the polyester film might be used as a raw material for the manufacture of resin products. If the dark color persists even after removal of free chlorine from the chips, this would limit the range of usefulness of the film as contemplated here, but it should still be useful for such purposes as the manufacture of rigid polyurethane foam systems. This latter potential application of the film, however, represents the greatest potential market for such scrap anyway. The impact of 16 million pounds of additional raw material "dumped" on the present U.S. market for rigid polyurethane foam systems would barely be noticed.

Regarding the possibility of shipping the contaminated film to Rhode Island for decontamination and subsequent use as a fuel, I am puzzled as to the economic feasibility of this plan. It would seem that the cost of shipping the film such a distance together with the cost of decontamination would exceed its fuel value. This composition is already in a partially oxidized state (33.3% by weight chemically-bound oxygen) and may well have to be incinerated as opposed to being used to provide heat energy in an

economically productive manner.

We understand the disposition of the subject x-ray film is a matter of some urgency. As there is a definite possibility that some significant value might be recovered after the principal cyanide contamination is removed, we suggest that you consider a short-term research project directed toward determination of the value of the film as a chemical raw material in the manufacture of synthetic resins. If the material is found to be useful after cleaning, there is a ready market for it in several synthetic resin areas, some of which have been mentioned hereinabove.

The first phase of such a project would involve, with cooperation from Petrochem, the attempted preparation of at least several useful resin raw materials from the scrap film. The viability, or lack thereof, of the cleaned film as a chemical raw material should be confirmed within 4-6 weeks of laboratory studies. If the film appears to be useful for such purposes, in a second 4-6 week period several end-use products such as unsaturated polyester resins and rigid polyurethane foams with actual commercial potential could be prepared and made available for the inspection of all concerned parties. At this point, the true market value of the film, after cleaning, could be estimated with some certainty.

Please let us know if you would like to discuss such a project. Epichem could make room for such an effort by about July 10th.

Thank you very much for your interest in bringing the film problem to our attention. We would be pleased to help find a practical use for the film, while at the same time contribute toward solution of an environmental problem.

Yours very truly,
EPICHEM, INC.

William H. Cook

William H. Cook
President

WHC:jz

cc: R. E. Farmer - Epichem
A. Goodman - Petrochem Services

Enclosure